

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An adhesive composition, comprising:
soy protein or a mixture of soy protein and lignin;
at least one substantially formaldehyde-free curing agent that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group that can react with at least one functional group of the soy protein; and
at least one compound selected from a boron compound, ~~a group IA oxide or hydroxide,~~
~~or a group IIA oxide or hydroxide.~~
2. (Original) The composition according to claim 1 wherein the composition is substantially formaldehyde-free.
3. (Currently amended) The composition according to claim 1 wherein the composition includes about 0.5 wt. % to about 10 wt. % of the at least one boron compound, ~~group IA oxide or hydroxide,~~
~~or hydroxide, or group IIA oxide or hydroxide,~~ based on the dry weight of the composition.
4. (Original) The composition of claim 1 wherein the boron compound is selected from boric acid, a boron salt, or a borate ester.
5. (Original) The composition of claim 1 wherein the boron compound comprises sodium borate, sodium borohydride or sodium tetraborate.
6. (Original) The composition of claim 1 wherein the curing agent is a reaction product of an epoxide with a polyamine resin, a reaction product of an epoxide with a polyamidoamine resin, or reaction product of epoxide with a polyamide resin.

7. (Original) The composition of claim 1 wherein the curing agent comprises a polyalkylene polyamine-epihalohydrin resin.

8. (Original) The composition of claim 7, wherein the curing agent comprises a reaction product of epichlorohydrin with ethylenediamine, bis-hexamethylenetriamine or hexamethylenediamine.

9. (Original) The composition of claim 5 wherein the soy protein comprises soy flour and the curing agent comprises a reaction product of epichlorohydrin with ethylenediamine, bis-hexamethylenetriamine or hexamethylenediamine.

10. (Original) The composition according to claim 3 wherein the composition includes about 2 wt. % to about 30 wt. % of the at least one curing agent, based on the dry weight of the composition.

11. (Currently amended) The composition according to claim 1, wherein the composition comprises a reaction product of the soy protein, the at least one curing agent, and the at least one boron compound.

Claims 12-13 (Canceled)

14. (Currently amended) A method for making an adhesive composition comprising mixing together:

soy protein or a mixture of soy protein and lignin;
at least one substantially formaldehyde-free curing agent that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group; and
at least one compound selected from a boron compound, a group IA oxide or hydroxide, or a group IIA oxide or hydroxide.

15. (Currently amended) A method for making an adhesive composition comprising:
mixing together at least one ~~compound selected from a boron compound, a group IA oxide or hydroxide, or a group IIA oxide or hydroxide~~ with at least one substantially formaldehyde-free curing agent that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group; and
contacting the resulting product with soy protein or a mixture of soy protein and lignin.

16. (Currently amended) The method of claim 15, wherein the at least one boron compound/curing agent product is contacted with the soy protein or mixture of soy protein and lignin under conditions sufficient for reacting the boron compound/curing agent product with the soy protein.

17. (Currently amended) The method of claim 15, wherein the soy protein comprises soy flour, the at least one curing agent comprises a reaction product of epichlorohydrin with ethylenediamine, bis-hexamethylenetriamine or hexamethylenediamine, and the at least one boron compound is selected from boric acid, a boron salt, or a borate ester, ~~sodium hydroxide, potassium hydroxide, calcium hydroxide, or calcium oxide.~~

18. (Original) An adhesive composition made according to claim 17.

19. (Currently amended) An adhesive composition produced from the following ingredients:

soy protein or a mixture of soy protein and lignin;
at least one substantially formaldehyde-free curing agent that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group; and
at least one boron compound ~~selected from a boron compound, a group IA oxide or hydroxide, or a group IIA oxide or hydroxide.~~

20. (Currently amended) An adhesive composition, comprising a reaction product of:
a first component selected from at least one of soy protein, lignin, or a mixture thereof;
and

at least one substantially formaldehyde-free curing agent comprising a polyalkylene polyamine-epichlorohydrin resin selected from (i) a reaction product of epichlorohydrin with ethylenediamine, (ii) a reaction product of epichlorohydrin with bis-hexamethylenetriamine, or (iii) a reaction product of epichlorohydrin with hexamethylenediamine.

21. (Original) The composition according to claim 20 wherein the composition is substantially formaldehyde-free.

22. (Original) The composition according to claim 20 wherein the composition includes about 2 wt. % to about 30 wt. % the curing agent, based on the dry weight of the composition.

23. (Original) The composition according to claim 20, wherein the first component is soy protein.

24. (Original) The composition according to claim 23, wherein the soy protein comprises soy flour.

25. (Original) The composition according to claim 20, wherein the composition comprises a reaction product of the first component and the at least one curing agent.

26. (Original) The composition according to claim 20, wherein the first component is lignin.

27. (Currently amended) A method for making an adhesive composition comprising mixing together:

a first ingredient selected from soy protein, lignin, or a mixture thereof; and

at least one substantially formaldehyde-free curing agent comprising a polyalkylene polyamine-epichlorohydrin resin selected from (i) a reaction product of epichlorohydrin with ethylenediamine, (ii) a reaction product of epichlorohydrin with bis-hexamethylenetriamine, (iii) or a reaction product of epichlorohydrin with hexamethylenediamine.

28. (Original) An adhesive composition made according to claim 27.

29. (Currently amended) A method for making a lignocellulosic composite, comprising:
applying an adhesive composition to at least one lignocellulosic substrate, the adhesive composition comprising (i) soy protein, (ii) at least one substantially formaldehyde-free curing agent that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group that can react with at least one functional group of the soy protein, and (iii) at least one boron compound ~~selected from a boron compound, a group IA oxide or hydroxide, or a group II~~ oxide or hydroxide; and

bonding the adhesive-applied lignocellulosic substrate to at least one other lignocellulosic substrate.

30. (Original) The method of claim 29, wherein the bonding comprises applying heat and pressure to an assembly of the adhesive-applied lignocellulosic substrate and the other lignocellulosic substrate.

31. (Original) The method of claim 29, wherein the lignocellulosic substrates comprises comminuted wood particles and the method comprises:

blending about 1 to about 12 weight percent of the adhesive composition with a mixture of the comminuted wood particles, the weight percent being based on the combined weight of the adhesive composition and the comminuted wood particles;

forming the adhesive/wood particle blend into a predetermined configuration; and
applying heat and pressure to the formed blend.

32. (Original) The method of claim 29, wherein the lignocellulosic substrates comprises a wood veneer substrate and the method comprises:

applying the adhesive composition to at least one surface of the wood veneer substrate;
forming an assembly of the adhesive-applied wood veneer substrates; and
applying heat and pressure to the assembly.

33. (Currently amended) The method of claim 29, wherein the at least one boron compound is selected from boric acid, a boron salt, or a borate ester, sodium hydroxide, potassium hydroxide, calcium hydroxide, or calcium oxide, and the curing agent comprises a resin that is (i) a reaction product of epichlorohydrin with ethylenediamine, (ii) a reaction product of epichlorohydrin with bis-hexamethylenetriamine or (iii) a reaction product of epichlorohydrin with hexamethylenediamine.

34. (Currently amended) A method for making a lignocellulosic composite, comprising: applying an adhesive composition to at least one lignocellulosic substrate, the adhesive composition comprising (i) a first component selected from soy protein, lignin, or a mixture thereof and (ii) at least one substantially formaldehyde-free curing agent comprising a polyalkylene polyamine-epichlorohydrin resin selected from (i) a reaction product of epichlorohydrin with ethylenediamine, (ii) a reaction product of epichlorohydrin with bis-hexamethylenetriamine, or (iii) a reaction product of epichlorohydrin with hexamethylenediamine; and

bonding the adhesive-applied lignocellulosic substrate to at least one other lignocellulosic substrate.

35. (Original) The method of claim 34, wherein the bonding comprises applying heat and pressure to an assembly of the adhesive-applied lignocellulosic substrate and the other lignocellulosic substrate.

36. (Original) The method of claim 34, wherein the lignocellulosic substrates comprises comminuted wood particles and the method comprises:

blending about 1 to about 12 weight percent of the adhesive composition with a mixture of the comminuted wood particles, the weight percent being based on the combined weight of the adhesive composition and the comminuted wood particles;

forming the adhesive/wood particle blend into a predetermined configuration; and

applying heat and pressure to the formed blend.

37. (Original) The method of claim 34, wherein the lignocellulosic substrates comprises a wood veneer substrate and the method comprises:

applying the adhesive composition to at least one surface of the wood veneer substrate;
forming an assembly of the adhesive-applied wood veneer substrates; and
applying heat and pressure to the assembly.

38. (Original) The method of claim 34, wherein the first component is soy protein.

39. (Original) The method of claim 34, wherein the first component is lignin.

40. (Original) A lignocellulosic composite made according to the method of claim 29.

41. (Original) A lignocellulosic composite made according to the method of claim 34.